WHAT IS CLAIMED IS:

1. A method of modulating splice site selection and splicing thereof, said method comprising the step of hybridizing an oligonucleotide-protein conjugate to a target pre-mRNA molecule in a cell or cell extract, wherein said oligonucleotide-protein conjugate comprises an oligonucleotide moiety capable of binding to a protein moiety which comprises at least two distinct sequence elements:

(i) a nucleic acid sequence that is complementary to a specific region upstream of said splice site in said target pre-mRNA molecule; and

(ii) an extension containing a protein binding site sequence element for covalently binding a protein; and

wherein said protein moiety comprises a protein capable of modulating splicing of said splice site upon binding with said protein binding site.

2. The method of claim 1, wherein said binding of said protein is effected prior to hybridizing of said oligonucleotide moiety to said target pre-mRNA molecule or thereafter

3. The method of claim 1, wherein said modulating is one of increasing or repressing splice site selection and splicing thereof.

4. The method of claim 1, wherein said splice site is a 5' splice site.

5. The method of claim 1, wherein said spice site is a 3' splice site.

6. The method of claim 1, wherein said cell is a mammalian cell.

7. The method of claim 1m wherein said cell is in a patient.

8. The method of claim 1, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides found anywhere between said splice site and 46 nucleotides upstream of said splice site.

9. The method of claim 1, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 16 to 36 base pairs upstream of said splice site.

10. The method of claim 1, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 20 to 26 base pairs upstream of said splice site.

11. The method of claim 1, wherein said protein binds to a single-stranded or double stranded nucleic acid molecule.

12. The method of claim 1, wherein said protein is selected from the group consisting of SR proteins, hnRNP proteins, RNA binding proteins, ribonucleoprotein, nucleic acid binding protein and single stranded DNA binding proteins.

13. The method of claim 1, wherein said protein is an hnRNP protein.

14. The method of claim 1, wherein said protein is hnRNP A1/A2 protein.

15. The method of claim 1, wherein said protein is a bacteriophage MS2 coat protein.

16. The method of claim 1, wherein said protein moiety is capable of hybridizing to a small RNA sequence capable of interacting with proteins and to form an RNA/protein complex.

17. The method of claim 16, wherein said small RNA sequence is selected from the group consisting of a snRNA, a snoRNA, the RNA subunit of telomerase, tRNA, and 5S RNA.

18. The method of claim 1, wherein said extension is a RNA sequence.

19. The method of claim 1, wherein said extension is a single-stranded DNA sequence.

20. The method of claim 1, wherein said extension is any modified form of DNA or RNA.

21. The method of claim 1, wherein said nucleic acid sequence is a RNA sequence.

22. The method of claim 21, wherein said RNA is any modified form of RNA.

23. The method of claim 1, wherein said oligonucleotide moiety comprises at least one modified internucleoside linkage.

24. The method of claim 23, wherein said modified internucleoside linkage is selected from the group consisting of phosphorothioate, methylphosphonate, phosphotriester, phosphorodithioate, and phosphoselenate linkages.

25. The method of claim 1, wherein said oligonucleotide moiety comprises at least one modified sugar moiety.

26. The method of claim 25, wherein said modified sugar moiety is a 2'-O-methyl group or a 2'-O-methooxyethyl group.

27. The method of claim 1, wherein said method is used to block a cryptic splice site in said pre-mRNA.

28. The method of claim 1, wherein said oligonucleotide moiety is having a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 to SEQ ID NO:14 and SEQ ID NO:18 to SEQ ID NO:33.

29. An oligonucleotide-protein conjugate for modulating splice site selection and splicing thereof in a target pre-mRNA molecule present in a cell or cell extract, which comprises an oligonucleotide moiety covalently attached to a protein moiety, wherein said oligonucleotide moiety comprises at least two distinct sequence elements:

(i) a nucleic acid sequence that is complementary to a specific region upstream of said splice site in said target pre-mRNA molecule; and

(ii) an extension containing a protein binding site sequence element, wherein said hybridizing of said oligonucleotide modulates splicing of said splice site in said target pre-mRNA molecule; and

wherein said protein moiety comprises a protein capable of modulating splicing of said splice site.

30. The oligonucleotide-protein conjugate of claim 29, wherein said extension is 5' CGU ACA CCA UCA GGG UAC-3' (SEQ ID NO: 1).

31. The oligonucleotide-protein conjugate of claim 29, wherein said oligonucleotide moiety is selected from the group consisting of SEQ ID

NO:1, SEQ ID NO:2 to SEQ ID NO:14 and SEQ ID NO:18 to SEQ ID NO:33.

32. The oligonucleotide-protein conjugate of claim 29, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides found anywhere between said splice site and 46 nucleotides upstream of said splice site.

33. The oligonucleotide-protein conjugate of claim 29, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 16 to 36 base pairs upstream of said splice site.

34. The oligonucleotide-protein conjugate of claim 29, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 20 to 26 base pairs upstream of said splice site.

35. The oligonucleotide-protein conjugate of claim 29, wherein said protein is selected from the group consisting of SR proteins, hnRNP proteins, RNA binding proteins, ribonucleoprotein and single stranded DNA binding proteins.

36. The oligonucleotide-protein conjugate of claim 29, wherein said protein is an hnRNP protein.

37. The oligonucleotide-protein conjugate of claim 29, wherein said protein is hnRNP A/B protein.

38. The oligonucleotide-protein conjugate of claim 29, wherein said protein is a bacteriophage MS2 coat protein.

39. The oligonucleotide-protein conjugate of claim 29, wherein said protein moiety is capable of hybridizing to a small RNA sequence capable of interacting with proteins and to form an RNA/protein complex.

40. The oligonucleotide-protein conjugate of claim 39, wherein said small RNA sequence is selected from the group consisting of a snRNA, a snoRNA, the RNA subunit of telomerase, tRNA, and 5S RNA.

41. The oligonucleotide-protein conjugate of claim 29, wherein said extension is a RNA sequence.

42. The oligonucleotide-protein conjugate of claim 29, wherein said extension is a single-stranded DNA sequence.

43. The oligonucleotide-protein conjugate of claim 29, wherein said extension of said oligonucleotide moiety is any modified form of DNA or RNA.

44. The oligonucleotide-protein conjugate of claim 29, wherein said nucleic acid sequence is a RNA sequence.

45. The oligonucleotide-protein conjugate of claim 44, wherein said RNA is any modified form of RNA.

46. The oligonucleotide-protein conjugate of claim 29, wherein said oligonucleotide moiety comprises at least one modified internucleoside linkage.

47. The oligonucleotide-protein conjugate of claim 46, wherein said modified internucleoside linkage is selected from the group consisting of phosphorothioate, methylphosphonate, phosphotriester, phosphorodithioate, and phosphoselenate linkages.

48. The oligonucleotide-protein conjugate of claim 29, wherein said oligonucleotide moiety comprises at least one modified sugar moiety.

49. The oligonucleotide-protein conjugate of claim 48, wherein said modified sugar moiety is a 2'-O-methyl group or a 2'-O-methooxyethyl group.

50. A method of creating an alternate form of mRNA comprising the step of administering to a cell or a cell extract a sufficient amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49.

51. A method of creating an alternate form of a protein comprising the step of administering to a cell or a cell extract a sufficient amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49.

52. The method of claim 51, wherein said alternate form of a protein functions as a dominant negative.

53. A method of reducing and/or inhibiting expression of an mRNA molecule or protein, said method comprising the step of administering to a

cell or a cell extract a sufficient amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49.

54. A method of reducing and/or inhibiting neuronal differentiation, said method comprising the step of administering to a cell or a cell extract a sufficient amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49.

55. A method of preventing a viral infection in a patient, said method comprising the step of administering a therapeutically effective amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49 to said patient.

56. The method of claim 55, wherein said viral infection is caused by human immunodeficiency virus.

57. The method of claim 55, wherein said patient is a mammal.

58. The method of claim 55, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

59. The method of claim 55, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,001 to 50 mg/kg.

60. The method of claim 55, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,01 to 10 mg/kg.

61. The method of claim 55, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,1 to 5 mg/kg.

62. A method for treating a disease resulting from a mutation leading to aberrant splicing in a patient, said method comprising the step of administering a therapeutically effective amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49 to said patient.

63. The method of claim 62, wherein said disease is selected from the group consisting of β-thalassemia, cystic fibrosis, haemophilia, retinoblastoma, analbuminemia, Lesch-Nyhan syndrome, acute intermittent porphyria, breast and ovarian cancer, carbohydrate-deficient glycoprotein syndrome type 1a, cerbrotendinous xanthomatosis, Ehlers-

Danlos syndrome type VI, Fanconi anemia, frontotemporal dementia, HPRT deficiency, Leigh's encephalomyelopathy, Marfan syndrome, metachromatic leukodystrophy (juvenile form), neurofibromatosis type 1, OCT deficiency, porphyria cutanea tarda, Sandhoff disease, severe combined immunodeficiency, spinal muscle atrophy, tyrosinemia type 1, and Duchenne muscular dystrophy.

64. The method of claim 62, wherein said patient is a mammal.

65. The method of claim 62, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

66. The method of claim 62, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,001 to 50 mg/kg.

67. The method of claim 62, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,01 to 10 mg/kg.

68. The method of claim 62, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,1 to 5 mg/kg.

69. A method for promoting cell death in a patient, said method comprising the step of administering an effective amount of the oligonucleotide-protein conjugate of any one of claim 29 to 49 to said patient.

70. The method of claim 69, wherein said cell is a cell of a neoplasm.

71. The method of claim 69, wherein said patient is a mammal.

72. The method of claim 69, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

73. The method of claim 69, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,001 to 50 mg/kg.

74. The method of claim 69, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,01 to 10 mg/kg.

75. The method of claim 69, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,1 to 5 mg/kg.

76. A method for preventing and/or reducing the growth of tumor cells in a patient, said method comprising the step of administering a therapeutically effective amount of the oligonucleotide-protein conjugate of any one of claims 29 to 49 to said patient.

77. The method of claim 76, wherein said tumor cells are selected from the group consisting of lung cancer cells, liver cancer cells, pancreatic cancer cells, brain cancer cells, colon cancer cells, kidney cancer cells, bone cancer cells, breast cancer cells, prostate cancer cells, uterine cancer cells, lymphoma cells, melanoma cells, myeloma cells, adenocarcinoma cells, thymoma cells and plasmacytoma cells.

78. The method of claim 76, wherein said patient is a mammal.

79. The method of claim 78, wherein said mammal is a human.

80. The method of claim 76, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

81. The method of claim 76, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,001 to 50 mg/kg.

82. The method of claim 76, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,01 to 10 mg/kg.

83. The method of claim 76, wherein said oligonucleotide-protein conjugate is administered in a range varying from 0,1 to 5 mg/kg.

84. A composition comprising the oligonucleotide-protein conjugate of any one of claims 29 to 49 in association with a pharmaceutically acceptable carrier.

85. An oligonucleotide moiety for modulating splice site selection and splicing thereof in a target pre-mRNA molecule present in a cell or cell extract, which comprises at least two distinct sequence elements:

(i) a nucleic acid sequence that is complementary to a specific region upstream of said splice site in said target pre-mRNA molecule; and

(ii) an extension containing a protein binding site sequence element for covalently binding a protein.

86. The oligonucleotide moiety of claim 85, wherein said extension is 5' CGU ACA CCA UCA GGG UAC-3' (SEQ ID NO: 1).

87. The oligonucleotide moiety of claim 83, wherein said oligonucleotide moiety is comprising a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2 to SEQ ID NO:14 and SEQ ID NO:18 to SEQ ID NO:33.

88. The oligonucleotide moiety of claim 85, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides found anywhere between said splice site and 46 nucleotides upstream of said splice site.

89. The oligonucleotide moiety of claim 85, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 16 to 36 base pairs upstream of said splice site.

90. The oligonucleotide moiety of claim 85, wherein said nucleic acid sequence element is substantially complementary to at least eight nucleotides beginning 20 to 26 base pairs upstream of said splice site.

91. The oligonucleotide moiety of claim 85, wherein said protein binding site is capable of binding to a protein selected from the group consisting of SR proteins, hnRNP proteins, RNA binding proteins, ribonucleoprotein and single stranded DNA binding proteins.

92. The oligonucleotide moiety of claim 85, wherein said protein binding site is capable of binding to an hnRNP protein.

93. The oligonucleotide moiety of claim 85, wherein said protein binding site is capable of binding to hnRNP A/B protein.

94. The oligonucleotide moiety of claim 85, wherein said protein binding site is capable of binding to a bacteriophage MS2 coat protein.

95. The oligonucleotide moiety of claim 85, wherein said extension is a RNA sequence.

96. The oligonucleotide moiety of claim 85, wherein said extension is a single-stranded DNA sequence.

97. The oligonucleotide moiety of claim 85, wherein said extension is any modified form of DNA or RNA.

98. The oligonucleotide moiety of claim 85, wherein said nucleic acid sequence is a RNA sequence.

99. The oligonucleotide moiety of claim 98, wherein said RNA is any modified form of RNA.

100. The oligonucleotide moiety of claim 85, wherein said oligonucleotide moiety comprises at least one modified internucleoside linkage.

101. The oligonucleotide moiety of claim 100, wherein said modified internucleoside linkage is selected from the group consisting of phosphorothioate, methylphosphonate, phosphotriester, phosphorodithioate, and phosphoselenate linkages.

102. The oligonucleotide moiety of claim 85, wherein said oligonucleotide moiety comprises at least one modified sugar moiety.

103. The oligonucleotide moiety of claim 102, wherein said modified sugar moiety is a 2'-O-methyl group or a 2'-O-methooxyethyl group.

104. A method of creating an alternate form of mRNA comprising the steps of administering to a cell or a cell extract a sufficient amount of the oligonucleotide moiety of any one of claims 85 to 103 and administering to said cell or said cell extract a purified protein capable of binding to said protein binding site.

105. A method of creating an alternate form of a protein comprising the steps of administering to a cell or a cell extract a sufficient amount of the oligonucleotide moiety of any one of claims 85 to 103 and administering to said cell or said cell extract a purified protein capable of binding to said protein binding site.

106. The method of claim 105, wherein said alternate form of a protein functions as a dominant negative.

107. A method of reducing and/or inhibiting expression of an mRNA molecule or protein, said method comprising the step of administering to a cell or a cell extract a sufficient amount of the oligonucleotide moiety of

any one of claims 85 to 103 and administering to said cell or said cell extract a purified protein capable of binding with said protein binding site.

108. A method of reducing and/or inhibiting neuronal differentiation, said method comprising the steps of administering to a cell or a cell extract a sufficient amount of the oligonucleotide moiety of any one of claims 85 to 103 and administering to said cell or said cell extract a purified protein capable of binding with said protein binding site.

109. A method of preventing a viral infection in a patient, said method comprising the step of administering a therapeutically effective amount of the oligonucleotide moiety of any one of claims 85 to 103 and a therapeutically effective amount of a purified protein capable of binding with said protein binding site to said patient.

110. The method of claim 109, wherein said viral infection is caused by human immunodeficiency virus.

111. The method of claim 109, wherein said patient is a mammal.

112. The method of claim 109, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

113. The method of claim 109, wherein said oligonucleotide moiety is administered in a range varying from 0,001 to 50 mg/kg.

114. The method of claim 109, wherein said oligonucleotide moiety is administered in a range varying from 0,01 to 10 mg/kg.

115. The method of claim 109, wherein said oligonucleotide moiety is administered in a range varying from 0,1 to 5 mg/kg.

116. A method for treating a disease resulting from a mutation leading to aberrant splicing in a patient, said method comprising the steps of administering a therapeutically effective amount of the oligonucleotide moiety of any one of claims 85 to 103 and a therapeutically effective amount of a purified protein capable of binding to said protein binding site to said patient.

117. The method of claim 116, wherein said disease is selected from the group consisting of β-thalassemia, cystic fibrosis, haemophilia, retinoblastoma, analbuminemia, Lesch-Nyhan syndrome, acute intermittent porphyria, breast and ovarian cancer, carbohydrate-deficient glycoprotein syndrome type 1a, cerbrotendinous xanthomatosis, Ehlers-Danlos syndrome type VI, Fanconi anemia, frontotemporal dementia, HPRT deficiency, Leigh's encephalomyelopathy, Marfan syndrome, metachromatic leukodystrophy (juvenile form), neurofibromatosis type 1, OCT deficiency, porphyria cutanea tarda, Sandhoff disease, severe combined immunodeficiency, spinal muscle atrophy, tyrosinemia type 1, and Duchenne muscular dystrophy.

118. The method of claim 116, wherein said patient is a mammal.

119. The method of claim 116, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

120. The method of claim 116, wherein said oligonucleotide moiety is administered in a range varying from 0,001 to 50 mg/kg.

121. The method of claim 116, wherein said oligonucleotide moiety is administered in a range varying from 0,01 to 10 mg/kg.

122. The method of claim 116, wherein said oligonucleotide moiety is administered in a range varying from 0,1 to 5 mg/kg.

123. A method for promoting cell death in a patient, said method comprising the steps of administering an effective amount of the oligonucleotide moiety of any one of claim 85 to 103 and an effective amount of a purified protein capable of binding to said protein binding site to said patient.

124. The method of claim 123, wherein said cell is a cell of a neoplasm.

125. The method of claim 123, wherein said patient is a mammal.

126. The method of claim 123, wherein said administering is effected through a route selected from the group consisting of oral, parenteral,

subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

127. The method of claim 123, wherein said oligonucleotide moiety is administered in a range varying from 0,001 to 50 mg/kg.

128. The method of claim 123, wherein said oligonucleotide moiety is administered in a range varying from 0,01 to 10 mg/kg.

129. The method of claim 123, wherein said oligonucleotide moiety is administered in a range varying from 0,1 to 5 mg/kg.

130. A method for preventing and/or reducing the growth of tumor cells in a patient, said method comprising the steps of administering a therapeutically effective amount of the oligonucleotide moiety of any one of claims 85 to 103 and a therapeutically effective amount of a purified protein capable of binding with said protein binding site to said patient.

131. The method of claim 130, wherein said tumor cells are selected from the group consisting of lung cancer cells, liver cancer cells, pancreatic cancer cells, brain cancer cells, colon cancer cells, kidney cancer cells, bone cancer cells, breast cancer cells, prostate cancer cells, uterine cancer cells, lymphoma cells, melanoma cells, myeloma cells, adenocarcinoma cells, thymoma cells and plasmacytoma cells.

132. The method of claim 130, wherein said patient is a mammal.

133. The method of claim 132, wherein said mammal is a human.

134. The method of claim 130, wherein said administering is effected through a route selected from the group consisting of oral, parenteral, subcutaneous, intradermal, intramuscular, intravenous, intraarterial, topical and nasal route.

135. The method of claim 130, wherein said oligonucleotide moiety is administered in a range varying from 0,001 to 50 mg/kg.

136. The method of claim 130, wherein said oligonucleotide moiety is administered in a range varying from 0,01 to 10 mg/kg.

137. The method of claim 130, wherein said oligonucleotide moiety is administered in a range varying from 0,1 to 5 mg/kg.

138. A composition comprising the oligonucleotide moiety of any one of claims 85 to 103 in association with a pharmaceutically acceptable carrier.